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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/715,899	11/18/2003	Michael F. Deering	5181-09612	5662

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EXAMINER

NGUYEN, PHU K

ART UNIT	PAPER NUMBER
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2671

DATE MAILED: 09/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/715,899	Applicant(s) DEERING, MICHAEL F.	
	Examiner Phu K. Nguyen	Art Unit 2671	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Phu K. Nguyen

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>11/18/2003</u> . | 6) <input type="checkbox"/> Other: _____ |

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over FORAN et al. (6,072,500).

As per claim 1, Foran teaches the claimed "graphics system" comprising: a graphics processor configured to generate a plurality of samples with a variable density (Foran, scan conversion subsystem 14), wherein the graphics processor generates at least a portion of the plurality of samples in a super-sampled manner (Foran, supersample coverage mask); a sample buffer coupled to said graphics processor for storing the plurality of samples having the variable density, wherein the plurality of samples comprised in the sample buffer correspond to an entire frame of a display (Foran, image processor buffer 52; column 5, lines 41-65); and a sample-to-pixel calculation unit coupled to said sample buffer, wherein said sample-to-pixel calculation unit is configured to select and filter said stored samples to form output pixels, (Foran, image processors 60; column 6, lines 9-32). It is noted that Foran does not explicitly teach "wherein the output pixels correspond to the entire frame of the display" as claimed. However, since the output pixels to the display subsystem 18 are used to represent the screen of the display 20, it would have been obvious to store those pixels as a frame of the display because such frame buffer will increase the efficiency of refreshing and updating of data in the screen.

Claim 2 adds into claim 1 "wherein said graphics processor is configured to vary the density of the samples generated on a basis selected from the group consisting of: a per-scan line basis, a per-group-of-scan-line basis, a per-region basis, a per-pixel basis, and a per-group-of-pixel basis" which Foran teaches in column 12, line 32 to column 13, line 55 in which the sub-samples are combined to yield the value of pixel in each specific region.

Claim 3 adds into claim 1 "wherein said density is varied according to one or more of the following: input from an eye-tracking device, input from a head-tracking device, input from a hand-tracking device, input from a mouse, a cursor position, a visible object position, and a main character position" which Foran teaches in column 3, lines 50-54, column 4, lines 11-30 in which the input is from host computer 10 with the polygon information.

Claim 4 adds into claim 1 "said density is varied according to input from a gaze tracking device" which Foran does not explicitly teach. However, given Foran's graphics processor 10, it would have been obvious to a person of ordinary skill in the art to have the input with varied density from a gaze tracking device because the accuracy and easy manipulation of the gaze tracking device.

Claim 5 adds into claim 1 "said density is selected on a per frame region basis

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from a predetermined group of densities" which Foran teaches in column 4, lines 6-17.

Claim 6 adds into claim 1 "said density is substantially continuously variable across one or more frame region boundaries" which Foran does not explicitly teach. However, given Foran's antialiasing technique, it would have been obvious to have the density being substantially continuous because it reduces artifacts by smoothing the appearance of the displayed image.

Claim 7 adds into claim 1 "said sample-to-pixel calculation unit is configured to filter samples to form output pixels on a real time basis" which Foran teaches in column 14, lines 6-26 in which the speed of operation significantly improves.

Claim 8 adds into claim 1 "said sample-to-pixel calculation unit is configured to filter samples to form output pixels on an on-the-fly basis" which Foran teaches in column 13, lines 37-55.

Claim 9 adds into claim 1 "at least a part of each sample is double-buffered in said sample buffer" which Foran does not explicitly. However, given Foran's image buffer for graphics data, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the double-buffer for storing data because

it reduces the processing time by allowing simultaneously read and write operations perform on the buffer.

Claim 10 adds into claim 1 "a sample position memory coupled to said graphics processor, wherein said sample position memory is configured to store information usable to determine sample positions" which Foran teaches in column 5, line 66 to column 6, line 8.

Claim 11 adds into claim 1 "a sample position memory coupled to said graphics processor, wherein said sample position memory is configured to store one or more sample position schemes, and wherein said graphics processor is configured to read sample positions from said sample position memory" which Foran teaches in column 5, line 66 to column 6, line 32.

Claim 12 adds into claim 1 "a sample position memory coupled to said graphics processor, wherein said sample position memory is configured to store one or more sample position schemes for one or more sample densities, wherein said graphics processor is configured to read sample positions from said sample position memory according to a selected sample density and a selected sample position scheme" which Foran teaches in column 5, line 66 to column 6, line 32; column 7, lines 31-49.

Claim 13 adds into claim 1 "said samples are stored in said sample buffer

according to bins, wherein each bin has a position, wherein said sample position memory is configured to store said sample positions as offsets relative to said bin positions" which Foran does not teach. However, given Foran's image region memories 52, it would have been obvious to arrange the memory into the sections such as bins because it increases the memory access time by allowing a group of pixel data to be processed simultaneously.

Claim 14 adds into claim 13 "said bin positions corresponds to pixel positions on a display device" which Foran does not explicitly teach. However, given Foran's sample mask at each pixel position (column 4, lines 9-11), it would have been obvious to represent each bin as the pixel containing the values of samples for that pixel because it increases the memory access time by allowing a group of sample data for each pixel to be processed simultaneously.

Claim 15 adds into claim 1 "said graphics processor is configured to store said samples into said sample buffer according to bins, and wherein said bins correspond to screen space areas" which Foran does not teach. However, given Foran's image region memories 52 and sample mask at each pixel position (column 4, lines 9-11), it would have been obvious to arrange the memory into the sections such as bins according to screen space area because it increases the memory access time by allowing a group of pixel data to be processed simultaneously.

Claim 16 adds into claim 1 "said graphics processor is configured to store said samples into said sample buffer according to bins, and wherein said bins correspond to screen space areas" which Foran does not teach. However, given Foran's image region memories 52 and sample mask at each pixel position (column 4, lines 9-11), it would have been obvious to arrange the memory into the sections such as bins according to screen space area because it increases the memory access time by allowing a group of pixel data to be processed simultaneously. This claim is identical to claim 15, and should be deleted or modified to avoid the double patenting issue.

Claim 17 adds into claim 1 "in generating the plurality of samples with a variable density, the graphics processor generates a first portion of the plurality of samples in a super-sampled manner and having a first density, and the graphics processor generates a second portion of the plurality of samples in a super-sampled manner and having a second different density" which Foran teaches in column 7, lines 19-30 with different supersampling records of different colors.

Claim 18 adds into claim 1 "the graphics processor generates at least a portion of the plurality of samples in a super-sampled manner such that each of at least a subset of the plurality of pixels has a corresponding plurality of samples" which Foran teaches in column 11, line 17 to column 12, line 17 in which the subset of plurality of pixels with their corresponding samples are generated.

Claims 19-23 claim a graphics system based on the graphics system of claims 1-18, therefore, they are rejected under the same reason.

Claims 24-25 claim method based on the system of claims 1-19; therefore, they are rejected under the same reason (see also Foran, column 15, lines 37-42).

Claim 16 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 15. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phu K. Nguyen whose telephone number is (703)305 - 9796. The examiner can normally be reached on M-F 8:00-4:30.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Phu K. Nguyen
September 15, 2004

Phu K. Nguyen
PHU K. NGUYEN
PATENT EXAMINER
EBC/PAIR